

CLAIMS

1. A device for controlling a voltage-controlled switch, comprising two circuits respectively for setting to a high level and for setting to a low level a control terminal of the voltage-controlled switch; wherein one at least of said circuits comprises:

5 a power transistor capable of connecting the control terminal to a high, respectively low, voltage;

a bipolar control transistor having its emitter, respectively its collector, connected to the control terminal of the power transistor, the base of the control transistor being adapted to receive a control current; and

10 a first diode having a cathode, respectively an anode, connected to a first predetermined voltage smaller than the high voltage, and having its anode, respectively its cathode, connected to the base of the control transistor.

2. The control device of claim 1, wherein said at least one of said circuits is  
15 the circuit for setting to the high level and comprises a first output terminal capable of being connected to the control terminal of the voltage-controlled switch;

the power and control transistors being first and second NPN-type bipolar transistors forming a Darlington assembly arranged between the first output terminal and the high voltage;

20 the anode of the first diode being connected to the base of the control transistor via a first controllable circuit breaker; and

the device being capable of being connected to a control block successively enabling:

a/ applying the control current to the Darlington assembly and turning on the first  
25 circuit breaker; and

b/ after a first predetermined duration, turning off the first circuit breaker.

3. The control device of claim 2, wherein the device further comprises first and second P-channel MOS transistors having sources connected to the high voltage, a  
30 controllable current source being connected to the drain of the first MOS transistor, the gates of the first and second MOS transistors being connected to the drain of the first MOS transistor and the drain of the second MOS transistor being connected to the base

of the control transistor and to the drain of a third N-channel MOS transistor, having its source connected to a low supply voltage and the gate of which is capable of being connected to the control block via a second controllable circuit breaker, a second diode having its cathode and its anode respectively connected to the drain of the third MOS transistor and to the first output terminal.

4. The control device of claim 3, wherein the first circuit breaker comprises a fourth P-channel MOS transistor having its source connected to the base of the control transistor and having its drain connected to the anode of the first diode, the gate of the fourth MOS transistor being connected via a third resistor to the drain of a fifth P-channel MOS transistor, the source of the fifth MOS transistor being connected to the high voltage, the gate of the fifth MOS transistor being connected to the gate of the first MOS transistor, the gate of the fourth MOS transistor being also connected:

to the anode of a first zener diode having its cathode connected to the anode of a second zener diode having its cathode connected to the base of the control transistor;

to the anode of a third diode having its cathode connected to the base of the control transistor; and

to the cathode of a fourth diode having its anode connected to the drain of the fifth MOS transistor; a fifth diode having its anode connected to the drain of the fifth MOS transistor and its cathode connected to the drain of a sixth N-channel MOS transistor having its source connected to a ground voltage and the gate of which is capable of being connected to the control block.

5. The control device of claim 3, wherein the second circuit breaker comprises a buffer circuit having an input terminal, an output terminal, and a control terminal, the output terminal of which can take three states: 1 or 0 according to whether the input terminal is at 1 or 0 when the control terminal is at 1, and a high-impedance state if the control terminal is at 0.

6. The control device of claim 2, wherein the circuit for setting to the low level comprises a second output terminal capable of being connected to the control terminal of the voltage-controlled switch and comprising:

a seventh N-channel MOS transistor arranged between the second output terminal and the low voltage, and the gate of which is capable of being connected to the control block via the second controllable circuit breaker; and

5 a limiting means controllable for, when the second circuit breaker is off, providing the gate of the seventh MOS transistor with an activation voltage as long as the voltage of the second output terminal is greater than a predetermined voltage ranging between the high and ground voltages;

the control block enabling, upon activation of the Darlington assembly, provision of a deactivation signal to the gate of the seventh MOS transistor and, a second predetermined duration after the turning-off of the first circuit breaker:

10 c/ deactivating the Darlington assembly and turning off the second circuit breaker; and

d/ after a third predetermined duration, turning on the second circuit breaker and providing an activation signal to the gate of the seventh MOS transistor.

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7. The control device of claim 6, wherein the limiting means comprises a third bipolar transistor arranged between the second output terminal and the gate of the seventh MOS transistor, and a sixth diode capable of canceling the base current of the third bipolar transistor when the voltage of the second output terminal is smaller than the second predetermined voltage.

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8. The control device of claim 7, wherein the collector of the third bipolar transistor is connected via a fourth resistor to the gate of the seventh MOS transistor, a fifth resistor connecting the gate of the seventh MOS transistor to the low voltage, the base of the third bipolar transistor being connected to the cathode of the sixth diode, having its anode connected to the second predetermined voltage, the base of the third bipolar transistor being also connected via a sixth resistor to the drain of an eighth N-type MOS transistor, having its source connected to the ground voltage and the gate of which is capable of being connected to the control block.

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9. The control device of claim 1, wherein said at least one of said circuits is the circuit for setting to the low level and comprises a first output terminal capable of

being connected to the control terminal of the voltage-controlled switch;

the power transistor being an N-channel MOS transistor; and

the control transistor being a PNP-type bipolar transistor having its emitter and its collector respectively connected to the drain and to the gate of the power transistor, the gate of the power transistor being further connected to the low voltage via a resistor and connected via a first controllable circuit breaker to a control terminal of the power transistor;

the device being capable of being connected to a control block enabling:

a/ turning off the first circuit breaker, and applying the control current of the control transistor; and

b/ after a first predetermined duration, deactivating the control current of the control transistor, turning on the first circuit breaker, and providing an activation signal to the gate of the power transistor.

10. The control device of claim 9, wherein the circuit for setting to the high level comprises:

a second output terminal capable of being connected to the control terminal of the voltage-controlled switch;

a Darlington assembly arranged between the second output terminal and the high voltage, a control terminal of the Darlington assembly being likely to receive a control current; and

a second diode having its cathode connected to a second predetermined voltage smaller than the high voltage and its anode connected to the control terminal of the Darlington assembly via a second controllable circuit breaker;

the control block enabling successively:

c/ providing a deactivation signal to the gate of the power transistor, applying the control current of the Darlington assembly, and turning on the second circuit breaker; and

d/ after a second predetermined duration, turning off the second circuit breaker.